

**CLAIMS:**

1. A side rail for mounting onto a patient support assembly, the patient support assembly having a longitudinal x-axis, a transversal y-axis and a vertical z-axis, said axes being mutually orthogonal to each other, the x-axis extending  
5 longitudinally along the patient support assembly, from a front portion of the assembly to an opposite rear portion thereof, the y-axis extending transversally across the patient support assembly, from a left side portion of the assembly to an opposite right side portion thereof, and the z-axis extending vertically along the  
10 patient support assembly, from a bottom portion of the assembly to an opposite top portion thereof, the side rail extending substantially along the x-axis of the patient support assembly, the side rail being operatively mountable onto a corresponding side portion of the patient support assembly, the side rail comprising:
  - a first support bar having upper and lower ends, the lower end of the  
15 first support bar being pivotally mountable to said corresponding side portion of the patient support assembly;
  - a second support bar having upper and lower ends, the lower end of the second support bar being pivotally mountable to said corresponding side portion of the patient support assembly; and
  - 20 at least one cross bar having first and second ends pivotally connected to the first and second support bars respectively;
the side rail being operable between a raised configuration where the at least one cross bar is above a segment of the patient support assembly for preventing egress of a patient from said assembly, and a lowered configuration where said at  
25 least one cross bar is below said segment of the patient support assembly for allowing egress of the patient from the assembly;
  - wherein the support bars and the at least one cross bar of the side rail are substantially positioned within a same vertical plane, being substantially parallel to the corresponding side portion of the patient support assembly, and wherein the  
30 first and second support bars are rotatable with respect to said corresponding side portion about respective axes being parallel to the y-axis, and the first and second ends of the at least one cross bar are rotatable with respect to the support bars

about respective axes being parallel to the y-axis, so that the side rail be operated between the raised and lowered configurations along said same vertical plane and so that the side rail be collapsible in the lowered configuration, within said same vertical plane.

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2. A side rail according to claim 1, wherein the side rail comprises a pivot bar having first and second ends, the first end of the pivot bar being pivotally mountable about said corresponding side portion of the patient support assembly and being rotatable thereabout about an axis parallel to the y-axis, and the second  
10 end of the pivot bar being pivotally connected to the lower end of the second support bar and being rotatable thereabout about an axis parallel to the y-axis, the pivot bar being shaped, positioned and dimensioned so as to prevent the side rail from exceeding a predetermined distance longitudinally along the patient support assembly when operated and collapsed into the lowered configuration.

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3. A side rail according to claim 1, wherein the lower end of the first support bar is provided with blocking means cooperable with the patient support assembly, and operable between a blocking configuration where the blocking means are engaged with the assembly and maintain the side rail in a raised  
20 configuration, and a release configuration where the blocking means are disengaged from the assembly for allowing the side rail to be operated into a lowered configuration.

4. A side rail according to claim 3, where the blocking means comprise  
25 a locking pin having a first extremity insertable into a corresponding hole of an adjacent plate of the assembly, the blocking means being in a blocking configuration when the locking pin is inserted into the hole of the plate, thereby preventing the first support bar from being rotated about the corresponding side portion of the patient support assembly, and the blocking means being in the  
30 release configuration when the locking pin is urged away from the hole of the plate, thereby enabling the first support bar to be rotated about the corresponding side

portion of the patient support assembly, and to be operated into the lowered configuration.

5        5.     A side rail according to claim 4, wherein the blocking means  
comprise biasing means operatively connected to the locking pin for biasing the  
same into the hole of the plate.

10       6.     A side rail according to claim 5, wherein the biasing means, locking  
pin and plate are positioned, shaped and sized with respect to one another to  
enable the blocking means to be automatically triggered into the blocking  
configuration when the side rail is operated back into the raised configuration from  
an intermediate configuration.

15       7.     A side rail according to claim 6, wherein the locking pin has a second  
extremity, opposite to the first extremity, provided with a knob for enabling an  
operator of the assembly to pull on said knob for urging the locking pin away from  
the hole of the plate.

20       8.     A hospital bed having a longitudinal x-axis, a transversal y-axis and a  
vertical z-axis, said axes being mutually orthogonal to each other, the x-axis  
extending longitudinally along the hospital bed, from a front portion of the bed to an  
opposite rear portion thereof, the y-axis extending transversally across the hospital  
bed, from a left side portion of the bed to an opposite right side portion thereof, and  
the z-axis extending vertically along the hospital bed, from a bottom portion of the  
25       bed to an opposite top portion thereof, the hospital bed comprising:

      a base structure extending substantially along the x-axis of the hospital bed,  
the base frame being movable along at least one of said axes;

      a patient support platform also extending substantially along the x-axis of  
the hospital bed, the patient support platform being operatively connected onto the  
base structure for receiving a patient thereon and having sections movable about  
30       at least one of said axes for assuming different configurations; and

at least one side rail also extending substantially along the x-axis of the hospital bed, each side rail being operatively mounted onto a corresponding side portion of the hospital bed, each side rail comprising:

5 a first support bar having upper and lower ends, the lower end of the first support bar being pivotally mounted to said corresponding side portion of the hospital bed;

a second support bar having upper and lower ends, the lower end of the second support bar being pivotally mounted to said corresponding side portion of the hospital bed; and

10 at least one cross bar having first and second ends pivotally connected to the first and second support bars respectively;

each side rail being operable between a raised configuration where the at least one cross bar is above a segment of the patient support platform for preventing egress of the patient from said platform, and a lowered configuration where said at least one cross bar is below said segment of the patient support platform for allowing egress of the patient from the platform;

15 wherein the support bars and the at least one cross bar of each side rail are substantially positioned within a same vertical plane, being substantially parallel to the corresponding side portion of the hospital bed, and wherein the first and second support bars are rotatable with respect to said corresponding side portion about respective axes being parallel to the y-axis, and the first and second ends of the at least one cross bar are rotatable with respect to the support bars about respective axes being parallel to the y-axis, so that each side rail be operated between the raised and lowered configurations along said same vertical plane and  
20 so that said each side rail be collapsible in the lowered configuration, within said same vertical plane.  
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9. A hospital bed according to claim 8, wherein each side rail comprises a pivot bar having first and second ends, the first end of the pivot bar being pivotally mounted about said corresponding side portion of the hospital bed and being rotatable thereabout about an axis parallel to the y-axis, and the second end of the pivot bar being pivotally connected to the lower end of the second support  
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bar and being rotatable thereabout about an axis parallel to the y-axis, the pivot bar being shaped, positioned and dimensioned so as to prevent each side rail from exceeding a predetermined distance longitudinally along the hospital bed when operated and collapsed into the lowered configuration.

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10. A hospital bed according to claim 9, wherein the lower end of the first support bar is provided with blocking means cooperable with the base structure, and operable between a blocking configuration where the blocking means are engaged with the base structure and maintain the side rail in a raised configuration, and a release configuration where the blocking means are disengaged from the base structure for allowing the side rail to be operated into a lowered configuration.

11. A hospital bed according to claim 10, where the blocking means comprise a locking pin having a first extremity insertable into a corresponding hole of an adjacent plate of the base structure, the blocking means being in a blocking configuration when the locking pin is inserted into the hole of the plate, thereby preventing the first support bar from being rotated about the corresponding side portion of the hospital bed, and the blocking means being in the release configuration when the locking pin is urged away from the hole of the plate, thereby enabling the first support bar to be rotated about the corresponding side portion of the hospital bed, and to be operated into the lowered configuration.

12. A hospital bed according to claim 11, wherein the blocking means comprise biasing means operatively connected to the locking pin for biasing the same into the hole of the plate.

13. A hospital bed according to claim 12, wherein the biasing means, locking pin and plate are positioned, shaped and sized with respect to one another to enable the blocking means to be automatically triggered into the blocking configuration when the side rail is operated back into the raised configuration from an intermediate configuration.

14. A hospital bed according to claim 13, wherein the locking pin has a second extremity, opposite to the first extremity, provided with a knob for enabling an operator of the hospital bed to pull on said knob for urging the locking pin away from the hole of the plate.

15. A hospital bed according to claim 8, wherein said at least one side rail comprises first and second side rails, the first side rail being operatively connected onto the left side portion of the hospital bed, and the second side rail being operatively connected onto the right side portion of the hospital bed.

16. A hospital bed according to claim 8, wherein said at least one side rail comprises first and second pairs of side rails, the first pair of side rails being operatively connected onto the left side portion of the hospital bed, and the second pair of side rails being operatively connected onto the right side portion of the hospital bed, each pair of side rails comprising first and second side rails, the first support bar of each of the first and second side rails being positioned substantially at a midpoint area along the bed and a constant distance being maintained between the first support bars of said first and second side rails when in the raised configuration, irrespectively of configuration assumed by the patient support platform.

17. A method of operating a side rail of a hospital bed, the method comprising the steps of:

- a) providing the hospital bed of claim 14, with the at least one side rail being in the raised configuration;
- b) pulling on the knob for operating the blocking means into a release configuration; and
- c) rotating the support bars of the at least one side rail within said same vertical plane so as to operate and collapse said at least one side rail into the lowered configuration.

18. A method of operating a side rail of a hospital bed, the method comprising the steps of:

- a) providing the hospital bed of claim 10, with the at least one side rail being in the lowered configuration; and
- 5 b) rotating the support bars of the at least one side rail within said same vertical plane until triggering the blocking means into a blocking configuration so as to operate said at least one side rail into the raised configuration.

10 19. A kit for assembling a side rail for mounting onto a patient support assembly having a longitudinal x-axis, a transversal y-axis and a vertical z-axis, said axes being mutually orthogonal to each other, the x-axis extending longitudinally along the patient support assembly, from a front portion of the assembly to an opposite rear portion thereof, the y-axis extending transversally  
15 across the patient support assembly, from a left side portion of the assembly to an opposite right side portion thereof, and the z-axis extending vertically along the patient support assembly, from a bottom portion of the assembly to an opposite top portion thereof, the kit comprising:

20 a first support bar having upper and lower ends, the lower end of the first support bar being pivotally mountable to said corresponding side portion of the patient support assembly;

a second support bar having upper and lower ends, the lower end of the second support bar being pivotally mountable to said corresponding side portion of the patient support assembly; and

25 at least one cross bar having first and second ends pivotally connectable to the first and second support bars respectively;

once assembled, the side rail extending substantially along the x-axis of the patient support assembly, the side rail being operatively mounted onto a corresponding side portion of the patient support assembly and being operable between a raised  
30 configuration where the at least one cross bar is above a segment of the patient support assembly for preventing egress of a patient from said assembly, and a

lowered configuration where said at least one cross bar is below said segment of the patient support assembly for allowing egress of the patient from the assembly;

wherein the support bars and the at least one cross bar of each side rail are  
substantially positioned within a same vertical plane, being substantially parallel to  
5 the corresponding side portion of the patient support assembly, and wherein the  
first and second support bars are rotatable with respect to said corresponding side  
portion about respective axes being parallel to the y-axis, and the first and second  
ends of the at least one cross bar are rotatable with respect to the support bars  
about respective axes being parallel to the y-axis, so that the side rail be operated  
10 between the raised and lowered configurations along said same vertical plane and  
so that the side rail be collapsible in the lowered configuration, within said same  
vertical plane.